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THE INFLUENCE OF LOCALITY, SEASON, AND TIME
OF DAY ON VISIBILITY DISTANCE

An office report

by

George M. Jemison
Associate Forester

U. S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE

Appalachian Forest Experiment Station
R. E. McArdle, Director
Asheville, N. C.

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During the past few years eastern national forests, national parks, and other forest fire protection agencies have been preparing detection plans which show the number and location of lookout points needed for the most efficient coverage of their protected lands. Ordinarily in detection planning each prospective lookout station must compete with every other one for a place in the final network. Relative values of potential observation points are determined from the amount and character of area visible from each point for normal or average visibility distance.^{1/}

Detection plans have been weak in one respect because normal visibility distance heretofore had to be estimated. Usually a normal range of visibility was adopted for a group of forests because the difference in normal visibility distance from one forest to another was unknown. Detection plans could be strengthened if the magnitude of these local differences in normal visibility distance were determined.

Current haze meter measurements of visibility distance provide the basis for day-to-day shifts in the number of lookout stations manned as the haziness of the atmosphere changes but an analysis of several years' records is necessary to show consistent sectional differences, and diurnal trends in the range of visibility. Knowledge of such sectional and seasonal differences is needed in detection planning because it shows what the normal strength of the detection force must be on each forest for each season of the year. Diurnal changes in visibility must be known to guide the scheduling of haze meter readings.

Variations in Visibility Distance

Realizing that ultimate improvement and refinement of detection plans will require information on variations in normal visibility distance, the Appalachian Forest Experiment Station and the Eastern Region of the Forest Service have cooperated in a study of visibility.^{2/} Approximately 50 national forest lookout stations measured visibility distance three times a day in the four cardinal directions from 1936

^{1/}Visibility distance is the maximum number of miles that lookout observers can distinguish a standard size of smoke column under specified atmospheric conditions.

^{2/}This study was initiated by C A Abell, formerly of the Appalachian Station, and D. W. Beck, of the Eastern Region.



through 1938, these data forming the basis for this report.

About 21,000 observations^{3/} were compiled to show what differences could be expected in normal visibility distance among five eastern national forests; namely, the Cumberland in Kentucky, the George Washington and Jefferson in Virginia, the Monongahela in West Virginia, and the White Mountain in New Hampshire. Additional data for other forests were not sufficiently adequate to summarize.

In all compilations zero visibilities caused by rain or fog were eliminated. Blanks in records were usually due to the fact that look-out stations were not manned in wet weather. Thus, the average visibilities and all other figures reported here actually apply to periods of fire-weather only.

Tables are available to convert haze meter readings to visibility distances for any size of smoke column. The haze meters themselves are calibrated on the basis of a standard-sized smoke, approximately equivalent in volume and density to the smoke produced by a 12-by-12-foot fire burning in light fuel, such as grass and leaves, on an average dry day.

In the eastern United States where light fuels predominate, the initial spread of fires is so rapid that they usually attain a much larger size than 12-by-12-feet within the 15-minute discovery time standard. It has been found that visibility distances in terms of eighth-acre smokes are a more satisfactory basis for detection planning.^{4/} Hence, compilations of visibility distance have been made for this size of smoke column. The standard 12-by-12-foot smoke is so widely used throughout other regions, however, that visibilities have been determined for this size column, as well, for comparative purposes. Figures 1 to 5 indicate that eighth-acre smokes, which have about six times the diameter of the standard smoke, can be seen approximately twice as far 100 percent of the time and one and one-half times as far 70 percent of the time.

The following three types of compilations have been made for each

^{3/}An "observation" is an average of four haze meter readings taken in the cardinal directions.

^{4/}See Technical Note No. 28, "Relation of Byram haze meter readings to safe visibility distance of smoke from an eighth-acre fire", by George M. Jamison, February 2, 1938, Appalachian Forest Experiment Station, Asheville, N. C.

forest on the basis of eighth-acre and standard 12-by-12-foot smokes: (1) the percentages of time that visibility distances equal 1, 2, 3, - up to the maximum number of miles for each month, (2) the average number of miles that smoke columns can be seen 70 percent of the time⁵/ for each year and month, and three different hours of the day, (3) the percent of time that visibility distance equals six miles by years, months, and time of day. Tables 1 to 30, which accompany this report, give these detailed figures for the five national forests.

Sectional Variation

Significant differences in normal visibility distance from one forest to another, summarized in Figure 6, may be explained largely on the basis of population density and industrial activity on or adjacent to the national forests because homes and factories are responsible for most of the smoke in the atmosphere. The Cumberland National Forest, with visibility distances but half of those on the White Mountain, has hundreds of people living within or near its boundaries. Large towns and industrial centers lie to the north and west, the directions from which prevailing winds blow. The White Mountain National Forest, on the other hand, largely lies in a thinly-populated and non-industrial section of New Hampshire. The clear masses of polar air that move across Canada from the north and west have picked up but little smoke and dust by the time they reach the White Mountains. Figures 1 to 5 further emphasize the sectional difference in visibility distance. A standard smoke can be seen six miles 79, 74, 56, 43, and 26 percent of the time, on the White Mountain, Jefferson, George Washington, Monongahela, and Cumberland National Forest, respectively.

Seasonal Variation

The influence of season on visibility distance is significant but can best be allowed for on a day-to-day basis because of the extremely variable nature of the events that cause seasonal differences. For example, on the Monongahela National Forest, November, 1936, had the lowest visibility average ever recorded for a single month. However, in November, 1938, the visibility distance approached the highest averages ever reached. The low visibility of 1936 was due to a preponderance of local fires.

Only on the White Mountain National Forest are seasonal variations of a magnitude that warrants consideration in detection planning.

⁵/The distance that smoke columns can be seen 70 percent of the time is a detection planning standard recommended for eastern forests. See "Planning a lookout system", by C. A. Abell and R. M. Beeman, May, 1937, Appalachian Forest Experiment Station, Asheville, N. C.

Here visibility distance 70 percent of the time ranges from 13.4 miles in June to 8.7 miles in August. Thus, from the standpoint of normal range of vision, more lookout observers should be planned for during the latter month.

As shown by Figures 7 and 8, visibility distance is low on all forests in the summer when atmospheric dust is most prevalent and in winter when local smokiness increases. It is highest in late spring and early fall.

Diurnal Variation

Visibility distance definitely varies from morning to night but the changes are too small to require consideration in detection planning. Visibility is lowest in the morning, greatest at noon, and slightly lower at 4 p.m. Thus, visibility is actually higher, during the part of the day when fire danger is the greatest, than is indicated by a morning haze meter reading. The differences in visibility distance approximate one mile and are relatively consistent throughout the year as shown in Figures 9 and 10.

Summary

Measured visibility distance, in addition to guiding day-to-day placement of lookout men, provides the basis necessary to strengthen detection plans which have heretofore failed to allow for normal differences in visibility distance from one forest to another.

Observations at 50 lookout points, 1936 to 1938, show that significant sectional variations in normal visibility distance exist among eastern national forests. Seasonal and diurnal changes in visibility are smaller and can best be allowed for on a day-to-day basis.



TABLE 1.

PERCENT OF TIME EIGHTH-ACRE SMOKE IS VISIBLE ON THE CUMBERLAND NATIONAL FOREST, BY MONTHS

| Visibility Distance: | | Month | | | | | | | | | | | | All | |
|----------------------|-------------------------|-------|-------|--------|--------|-------|-------|-------|-------|--------|-------|-------|-------|---------|--------|
| miles | Distance: | :Jan. | :Feb. | :March | :April | :May | :June | :July | :Aug. | :Sept. | :Oct. | :Nov. | :Dec. | :months | |
| | Percent of time visible | | | | | | | | | | | | | | |
| 1 | :100 | :100 | :100 | :100 | :100 | :100 | :100 | :100 | :100 | :100 | :100 | :100 | :100 | :100 | :100.0 |
| 2 | :92.1 | :97.3 | :96.9 | :98.7 | :99.1 | :99.6 | :99.4 | :98.8 | :99.2 | :92.3 | :96.0 | :95.7 | :97.1 | | |
| 3 | :84.3 | :92.6 | :86.7 | :93.7 | :96.8 | :96.2 | :94.9 | :96.7 | :97.8 | :87.2 | :83.3 | :84.0 | :90.7 | | |
| 4 | :70.6 | :82.7 | :75.8 | :86.5 | :93.5 | :91.0 | :84.2 | :92.1 | :95.7 | :81.2 | :67.9 | :69.6 | :81.7 | | |
| 5 | :63.8 | :76.0 | :68.8 | :78.5 | :90.0 | :86.8 | :71.5 | :89.7 | :93.2 | :75.6 | :57.4 | :58.0 | :74.9 | | |
| 6 | :50.1 | :62.4 | :54.1 | :65.8 | :79.5 | :77.2 | :58.2 | :77.3 | :87.5 | :66.2 | :40.8 | :41.0 | :62.1 | | |
| 7 | :39.6 | :51.4 | :40.8 | :55.1 | :69.1 | :65.2 | :39.9 | :66.6 | :77.3 | :57.7 | :29.4 | :30.5 | :50.9 | | |
| 8 | :26.3 | :36.3 | :25.2 | :39.6 | :53.1 | :51.2 | :23.4 | :50.3 | :62.1 | :42.7 | :20.1 | :17.6 | :36.7 | | |
| 9 | :15.7 | :22.1 | :11.2 | :27.0 | :37.2 | :36.0 | :10.1 | :38.5 | :50.6 | :31.6 | :12.2 | :9.8 | :24.7 | | |
| 10 | :9.6 | :12.8 | :5.1 | :15.7 | :19.5 | :21.7 | :0.6 | :19.9 | :32.8 | :20.5 | :6.8 | :5.4 | :14.0 | | |
| 11 | :6.2 | :8.8 | :3.6 | :11.9 | :12.0 | :14.5 | | :13.1 | :24.4 | :14.5 | :5.1 | :3.7 | :9.7 | | |
| 12 | :1.5 | :4.2 | :1.9 | :6.8 | :4.5 | :7.5 | | :8.4 | :13.5 | :8.1 | :2.4 | :2.8 | :5.0 | | |
| 13 | :0.3 | :0.6 | :0.9 | :4.6 | :1.5 | :3.2 | | :4.9 | :2.9 | :4.7 | :1.5 | :1.5 | :2.4 | | |
| 14 | | :0.1 | :0.3 | :3.5 | :1.0 | :1.5 | | :2.3 | :2.9 | :2.1 | :1.1 | :0.9 | :1.3 | | |
| 15 | | | | :1.6 | | :0.6 | | :0.5 | :1.4 | | :0.2 | :0.3 | :0.5 | | |
| 16 | | | | :0.9 | | | | :0.2 | :0.2 | :1.3 | | | :0.2 | | |
| 17 | | | | | | | | | | | | | | | |
| 18 | | | | :0.1 | :0.1 | | | | | :0.4 | | | :0.1 | | |

Visibility Distance:

70% of time, miles : 4.1 : 5.4 : 4.8 : 5.7 : 6.9 : 6.6 : 5.1 : 6.7 : 7.5 : 5.6 : 3.9 : 4.0 : 5.4

Basis, number of

observations : 585 : 625 : 686 : 681 : 682 : 469 : 158 : 572 : 512 : 234 : 826 : 652:6,682

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the transparency and accountability of the organization. This section also outlines the various methods used to collect and analyze data, ensuring that the information is reliable and up-to-date.

2. The second part of the document focuses on the financial aspects of the organization. It provides a detailed overview of the budget, including the projected income and expenses for the upcoming year. This section also discusses the various financial risks that the organization may face and the strategies used to mitigate these risks.

3. The third part of the document addresses the operational aspects of the organization. It describes the various processes and procedures that are in place to ensure the efficient and effective delivery of services. This section also discusses the various challenges that the organization may face in the future and the strategies used to address these challenges.

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5. The fifth part of the document discusses the marketing and public relations of the organization. It describes the various strategies used to promote the organization's services and build a strong reputation. This section also discusses the various challenges that the organization may face in the future and the strategies used to address these challenges.

6. The sixth part of the document discusses the legal and regulatory aspects of the organization. It provides a detailed overview of the various laws and regulations that the organization must comply with. This section also discusses the various strategies used to ensure that the organization is in full compliance with all applicable laws and regulations.

7. The seventh part of the document discusses the environmental and social aspects of the organization. It describes the various strategies used to minimize the organization's environmental impact and promote social responsibility. This section also discusses the various challenges that the organization may face in the future and the strategies used to address these challenges.

8. The eighth part of the document discusses the future of the organization. It provides a detailed overview of the various opportunities and challenges that the organization may face in the future. This section also discusses the various strategies used to ensure that the organization is well-positioned to succeed in the future.

TABLE 2.

VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE ON CUMBERLAND NATIONAL FOREST,
BY MONTHS AND HOURS OF DAY

Basis: 6,682 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | 12:00 noon | | 4:00 P. M. | |
|-----------|------------|------|------------|------|------------|------|
| | 1936 | 1937 | 1936 | 1937 | 1936 | 1937 |
| January | | 3.9 | | 4.9 | | 3.9 |
| February | | 4.8 | | 5.8 | | 5.6 |
| March | | 3.9 | | 5.3 | | 5.2 |
| April | | 5.4 | | 6.1 | | 5.6 |
| May | | 5.9 | | 7.5 | | 7.4 |
| June | | 5.9 | | 7.3 | | 6.8 |
| July | | 4.5 | | 5.2 | | 5.7 |
| August | | 5.8 | | 7.2 | | 7.0 |
| September | | 6.8 | | 8.0 | | 7.6 |
| October | 4.7 | | 7.2 | | 5.6 | |
| November | 3.5 | | 4.4 | | 3.9 | |
| December | 3.5 | | 4.6 | | 4.0 | |

TABLE 3.

PERCENT OF TIME VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE EQUALS 6 MILES
OR MORE ON CUMBERLAND NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 6,682 observations

| Month | 9:00 A. M. | | 12:00 noon | | 4:00 P. M. | |
|-----------|------------|------|------------|------|------------|------|
| | 1936 | 1937 | 1936 | 1937 | 1936 | 1937 |
| January | | 44.1 | | 60.2 | | 45.8 |
| February | | 55.1 | | 67.3 | | 64.6 |
| March | | 38.6 | | 62.1 | | 61.5 |
| April | | 61.7 | | 71.1 | | 64.4 |
| May | | 69.0 | | 85.8 | | 83.4 |
| June | | 68.6 | | 82.0 | | 80.9 |
| July | | 50.0 | | 59.6 | | 65.4 |
| August | | 67.2 | | 83.8 | | 80.7 |
| September | | 80.6 | | 94.8 | | 87.0 |
| October | 54.5 | | 78.5 | | 65.4 | |
| November | 31.3 | | 50.2 | | 41.0 | |
| December | 33.8 | | 47.7 | | 41.3 | |

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TABLE 4.

PERCENT OF TIME STANDARD SMOKE IS VISIBLE ON THE CUMBERLAND NATIONAL FOREST, BY MONTHS

| Visibility Distance: miles | Month | | | | | | | | | | | | All months |
|-------------------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|
| | :Jan. | :Feb. | :Mar. | :April | :May | :June | :July | :Aug. | :Sept. | :Oct. | :Nov. | :Dec. | |
| | Percent of time visible | | | | | | | | | | | | |
| 1 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 |
| 2 | :87.1 | :95.9 | :91.7 | :97.3 | :97.4 | :97.8 | :95.6 | :97.5 | :98.1 | :90.1 | :85.2 | :87.1 | :93.3 |
| 3 | :67.2 | :78.8 | :70.2 | :82.7 | :91.2 | :89.6 | :73.0 | :90.4 | :94.0 | :80.1 | :63.0 | :64.9 | :78.5 |
| 4 | :51.4 | :62.6 | :50.9 | :67.6 | :80.5 | :77.7 | :59.2 | :78.1 | :86.1 | :68.9 | :41.9 | :42.5 | :63.4 |
| 5 | :29.9 | :54.1 | :33.0 | :46.9 | :59.8 | :57.6 | :26.9 | :58.6 | :69.2 | :52.8 | :25.5 | :21.8 | :43.0 |
| 6 | :15.8 | :22.5 | :12.3 | :28.8 | :38.9 | :36.2 | :10.1 | :39.2 | :50.2 | :32.1 | :12.5 | :9.7 | :25.4 |
| 7 | :7.0 | :10.6 | :4.8 | :14.2 | :16.9 | :17.3 | : | :19.2 | :30.0 | :18.6 | :5.7 | :4.2 | :12.4 |
| 8 | :1.7 | :4.2 | :2.1 | :6.4 | :4.6 | :7.5 | : | :8.3 | :13.2 | :6.9 | :2.4 | :2.3 | :4.9 |
| 9 | :0.2 | :0.6 | :0.6 | :3.4 | :1.1 | :1.7 | : | :3.3 | :3.7 | :1.3 | :1.1 | :0.9 | :1.6 |
| 10 | : | : | : | :1.3 | :0.1 | :0.6 | : | :0.2 | :1.0 | :0.9 | :0.1 | :0.1 | :0.4 |
| 11 | : | : | : | :0.1 | :0.1 | : | : | : | : | :0.4 | : | :0.1 | :0.1 |
| 12 | : | : | : | : | :0.1 | : | : | : | : | :0.4 | : | :0.1 | :0.04 |

| | | | | | | | | | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Visibility Distance: | | | | | | | | | | | | | |
| 70% of time, miles: | 2.9 | 3.5 | 3.0 | 3.8 | 4.5 | 4.4 | 3.2 | 4.4 | 5.0 | 3.9 | 2.7 | 2.8 | 3.6 |
| Basis, number of observations | : 553 | : 616 | : 665 | : 703 | : 700 | : 468 | : 159 | : 568 | : 509 | : 231 | : 806 | : 687 | : 6665 |

TABLE 5.

VISIBILITY DISTANCE OF STANDARD SMOKE ON CUMBERLAND NATIONAL FOREST,
BY MONTHS AND HOURS OF DAY

Basis: 6,665 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | 12:00 noon | | 4:00 P. M. | |
|-----------|------------|------|------------|------|------------|------|
| | 1936 | 1937 | 1936 | 1937 | 1936 | 1937 |
| January | | 2.9 | | 3.4 | | 2.8 |
| February | | 3.2 | | 3.9 | | 3.7 |
| March | | 2.8 | | 3.2 | | 3.5 |
| April | | 3.7 | | 4.1 | | 3.8 |
| May | | 4.0 | | 4.8 | | 4.8 |
| June | | 4.1 | | 4.6 | | 4.5 |
| July | | 2.9 | | 3.3 | | 3.6 |
| August | | 4.0 | | 4.8 | | 4.6 |
| September | | 4.5 | | 5.5 | | 5.1 |
| October | 3.2 | | 4.6 | | 3.9 | |
| November | 2.4 | | 2.9 | | 2.8 | |
| December | 2.5 | | 3.2 | | 2.7 | |

TABLE 6.

PERCENT OF TIME VISIBILITY DISTANCE OF STANDARD SMOKE EQUALS 6 MILES
OR MORE ON CUMBERLAND NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 6,665 observations

| Month | 9:00 A. M. | | 12:00 noon | | 4:00 P. M. | |
|-----------|------------|------|------------|------|------------|------|
| | 1936 | 1937 | 1936 | 1937 | 1936 | 1937 |
| January | | 12.5 | | 20.6 | | 16.0 |
| February | | 22.1 | | 20.1 | | 25.8 |
| March | | 5.0 | | 16.1 | | 15.0 |
| April | | 22.8 | | 34.8 | | 28.8 |
| May | | 25.5 | | 45.1 | | 46.2 |
| June | | 25.2 | | 43.1 | | 40.4 |
| July | | 1.8 | | 15.1 | | 13.5 |
| August | | 25.7 | | 51.6 | | 40.3 |
| September | | 38.3 | | 60.8 | | 53.2 |
| October | 17.8 | | 41.2 | | 35.9 | |
| November | 6.6 | | 17.4 | | 13.6 | |
| December | 6.0 | | 12.7 | | 10.7 | |

TABLE 7.

PERCENT OF TIME EIGHTH-ACRE SMOKE IS VISIBLE ON THE GEORGE WASHINGTON
NATIONAL FOREST, BY MONTHS

| Visibility Distance: miles | Month | | | | | | All months |
|-------------------------------|-------------------------|---------|---------|---|---------|---------|---------------|
| | :March | :April | :May | : | :Oct. | :Nov. | |
| | Percent of time visible | | | | | | |
| 1 | : 100.0 | : 100.0 | : 100.0 | : | : 100.0 | : 100.0 | : 100.0 |
| 2 | : 99.3 | : 100.0 | : 100.0 | : | : 99.9 | : 100.0 | : 99.9 |
| 3 | : 99.0 | : 99.2 | : 100.0 | : | : 99.7 | : 98.9 | : 99.3 |
| 4 | : 97.1 | : 97.3 | : 97.3 | : | : 98.6 | : 96.8 | : 97.3 |
| 5 | : 94.6 | : 95.6 | : 97.0 | : | : 97.5 | : 93.8 | : 95.4 |
| 6 | : 88.8 | : 90.4 | : 93.2 | : | : 93.3 | : 86.5 | : 89.8 |
| 7 | : 81.5 | : 81.3 | : 89.1 | : | : 86.4 | : 76.6 | : 81.8 |
| 8 | : 66.3 | : 67.5 | : 78.8 | : | : 74.4 | : 65.1 | : 69.4 |
| 9 | : 50.9 | : 52.3 | : 67.8 | : | : 60.4 | : 53.5 | : 56.2 |
| 10 | : 39.5 | : 39.2 | : 53.6 | : | : 46.8 | : 41.7 | : 43.6 |
| 11 | : 29.7 | : 31.8 | : 42.1 | : | : 37.2 | : 34.9 | : 35.0 |
| 12 | : 22.3 | : 23.4 | : 32.5 | : | : 29.5 | : 26.3 | : 26.6 |
| 13 | : 11.9 | : 15.1 | : 21.2 | : | : 21.4 | : 18.2 | : 17.6 |
| 14 | : 9.3 | : 12.0 | : 15.7 | : | : 17.7 | : 15.3 | : 14.1 |
| 15 | : 5.7 | : 8.5 | : 11.9 | : | : 14.0 | : 11.8 | : 10.5 |
| 16 | : 4.0 | : 5.0 | : 8.5 | : | : 9.4 | : 7.4 | : 6.8 |
| 17 | : 2.9 | : 3.6 | : 7.2 | : | : 7.1 | : 4.9 | : 5.0 |
| 18 | : 2.6 | : 2.8 | : 5.9 | : | : 4.4 | : 3.9 | : 3.9 |
| 19 | : 1.9 | : 2.2 | : 4.8 | : | : 2.7 | : 2.7 | : 2.8 |
| 20 | : 1.9 | : 1.2 | : 3.2 | : | : 1.3 | : 1.4 | : 1.7 |
| 21 | : 1.4 | : 0.7 | : 1.6 | : | : 0.7 | : 0.5 | : 0.9 |
| 22 | : 1.4 | : 0.7 | : 1.3 | : | : 0.5 | : 0.5 | : 0.8 |
| 23 | : 0.5 | : 0.5 | : 1.1 | : | : 0.5 | : 0.3 | : 0.5 |
| 24 | : 0.2 | : 0.3 | : 0.6 | : | : 0.5 | : 0.3 | : 0.3 |
| 25 | : | : 0.1 | : 0.3 | : | : 0.5 | : 0.1 | : 0.2 |
| 26 | : | : | : 0.3 | : | : 0.2 | : 0.1 | : 0.1 |
| 27 | : | : | : | : | : 0.2 | : | : 0.02 |

| | | | | | | | |
|----------------------|-------|-------|-------|---|-------|-------|-----|
| Visibility Distance: | | | | | | | |
| 70% of time, miles : | 7.7 : | 7.8 : | 8.8 : | : | 8.3 : | 7.6 : | 8.0 |

| | | | | | | | |
|--------------------|-------|-------|-------|---|-------|--------|------|
| Basis, number of : | | | | | | | |
| observations : | 579 : | 961 : | 707 : | : | 594 : | 1397 : | 4238 |

TABLE 8.

VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE ON GEORGE WASHINGTON NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 4,238 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| March | | 7.4 | 7.3 | | 8.0 | 8.0 | | 7.6 | 8.6 |
| April | | 7.7 | 7.5 | | 7.8 | 8.1 | | 7.9 | 7.9 |
| May | | 8.0 | 8.9 | | 8.5 | 10.3 | | 8.1 | 10.1 |
| October | | 7.9 | 7.5 | | 8.4 | 8.3 | | 8.1 | 8.3 |
| November | 7.1 | 8.5 | 6.6 | 7.6 | 8.6 | 7.3 | 7.5 | 8.1 | 6.3 |

TABLE 9.

PERCENT OF TIME VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE EQUALS 6 MILES OR MORE ON GEORGE WASHINGTON NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 4,238 observations

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| March | | 86.9 | 86.4 | | 93.2 | 91.7 | | 82.1 | 92.6 |
| April | | 90.6 | 87.5 | | 90.7 | 93.1 | | 88.8 | 91.6 |
| May | | 88.0 | 97.9 | | 90.4 | 99.0 | | 90.9 | 97.8 |
| October | | 98.1 | 86.0 | | 96.6 | 92.6 | | 96.6 | 91.3 |
| November | 81.7 | 95.8 | 78.7 | 86.8 | 91.7 | 86.0 | 85.5 | 87.2 | 75.6 |

TABLE 10.

PERCENT OF TIME STANDARD SMOKE IS VISIBLE ON THE GEORGE WASHINGTON
NATIONAL FOREST, BY MONTHS

| Visibility Distance: | Month | | | | | | All |
|----------------------|-------------------------|---------|---------|---|----------|---------|---------|
| miles | :March | :April | :May | : | :October | :Nov. | :months |
| | Percent of time visible | | | | | | |
| 1 | : 100.0 | : 100.0 | : 100.0 | : | : 100.0 | : 100.0 | : 100.0 |
| 2 | : 99.4 | : 100.0 | : 100.0 | : | : 99.8 | : 99.2 | : 99.6 |
| 3 | : 94.1 | : 96.8 | : 97.0 | : | : 97.1 | : 95.4 | : 96.0 |
| 4 | : 87.9 | : 90.5 | : 93.1 | : | : 92.8 | : 88.0 | : 90.0 |
| 5 | : 73.3 | : 73.4 | : 82.1 | : | : 77.1 | : 72.9 | : 75.1 |
| 6 | : 51.3 | : 52.1 | : 67.9 | : | : 54.4 | : 57.4 | : 56.8 |
| 7 | : 35.2 | : 35.3 | : 48.3 | : | : 32.6 | : 39.0 | : 38.5 |
| 8 | : 22.4 | : 22.6 | : 32.4 | : | : 20.9 | : 25.7 | : 26.2 |
| 9 | : 9.6 | : 12.3 | : 17.8 | : | : 11.2 | : 15.9 | : 14.0 |
| 10 | : 4.1 | : 6.3 | : 11.4 | : | : 5.8 | : 9.1 | : 7.7 |
| 11 | : 2.4 | : 3.4 | : 7.2 | : | : 3.6 | : 4.7 | : 4.4 |
| 12 | : 1.6 | : 2.2 | : 5.4 | : | : 1.8 | : 3.1 | : 3.0 |
| 13 | : 1.4 | : 1.0 | : 2.4 | : | : 0.9 | : 1.0 | : 1.3 |
| 14 | : 0.5 | : 0.7 | : 1.3 | : | : 0.2 | : 0.3 | : 0.6 |
| 15 | : 0.2 | : 0.2 | : 0.6 | : | : 0.2 | : 0.2 | : 0.3 |
| 16 | : | : | : | : | : 0.2 | : 0.1 | : 0.05 |

| | | | | | | | |
|----------------------|-----|---|-----|---|-----|---|-----------------|
| Visibility Distance: | | | | | | | |
| 70% of time, miles : | 5.2 | : | 5.2 | : | 5.9 | : | 5.3 : 5.2 : 5.3 |

| | | | | | | | |
|------------------|-----|---|-----|---|-----|---|--------------------|
| Basis, number of | : | | | | | | |
| observations : | 580 | : | 945 | : | 709 | : | 445 : 1445 : 4,124 |

TABLE 11.

VISIBILITY DISTANCE OF STANDARD SMOKE ON GEORGE WASHINGTON NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 4,124 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| March | | 4.9 | 4.7 | | 5.2 | 5.5 | | 4.9 | 5.9 |
| April | | 5.0 | 4.9 | | 5.2 | 5.4 | | 5.2 | 5.3 |
| May | | 5.1 | 6.0 | | 5.5 | 6.8 | | 5.4 | 6.8 |
| October | | 5.3 | 4.8 | | 5.5 | 5.5 | | 5.3 | 5.5 |
| November | 4.7 | 6.0 | 4.4 | 5.0 | 6.2 | 4.8 | 4.9 | 6.0 | 4.3 |

TABLE 12.

PERCENT OF TIME VISIBILITY DISTANCE OF STANDARD SMOKE EQUALS 6 MILES OR MORE ON GEORGE WASHINGTON NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 4,124 observations

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| March | | 40.6 | 42.0 | | 51.9 | 58.9 | | 46.2 | 67.7 |
| April | | 40.9 | 47.5 | | 55.4 | 60.9 | | 45.7 | 59.6 |
| May | | 51.9 | 70.5 | | 60.3 | 89.8 | | 61.8 | 86.0 |
| October | | 56.8 | 37.5 | | 63.3 | 56.8 | | 55.9 | 59.8 |
| November | 49.0 | 70.5 | 37.3 | 54.8 | 74.1 | 44.6 | 52.9 | 69.4 | 42.2 |

TABLE 13.

PERCENT OF TIME EIGHTH-ACRE SMOKE IS VISIBLE ON THE JEFFERSON NATIONAL
FOREST, BY MONTHS

| Visibility Distance: miles | March | April | May | : | Oct. | Nov. | All months |
|-------------------------------|-------------------------|---------|---------|---|---------|---------|---------------|
| | Percent of time visible | | | | | | |
| 1 | : 100.0 | : 100.0 | : 100.0 | : | : 100.0 | : 100.0 | : 100.0 |
| 2 | : 100.0 | : 100.0 | : 100.0 | : | : 100.0 | : 100.0 | : 100.0 |
| 3 | : 99.6 | : 100.0 | : 100.0 | : | : 100.0 | : 99.6 | : 99.8 |
| 4 | : 98.5 | : 100.0 | : 99.7 | : | : 99.1 | : 97.0 | : 98.6 |
| 5 | : 98.1 | : 99.8 | : 99.7 | : | : 97.8 | : 95.4 | : 97.8 |
| 6 | : 91.8 | : 97.6 | : 98.5 | : | : 94.7 | : 92.2 | : 94.8 |
| 7 | : 87.3 | : 93.6 | : 95.5 | : | : 90.4 | : 82.3 | : 91.0 |
| 8 | : 74.6 | : 88.9 | : 91.6 | : | : 79.0 | : 79.1 | : 82.8 |
| 9 | : 62.3 | : 74.2 | : 80.3 | : | : 69.7 | : 68.6 | : 71.1 |
| 10 | : 53.0 | : 60.9 | : 64.5 | : | : 55.2 | : 57.6 | : 58.5 |
| 11 | : 45.1 | : 47.8 | : 55.8 | : | : 46.3 | : 48.6 | : 48.7 |
| 12 | : 33.2 | : 31.9 | : 37.0 | : | : 34.9 | : 37.0 | : 35.0 |
| 13 | : 19.4 | : 15.9 | : 21.2 | : | : 17.9 | : 23.8 | : 20.0 |
| 14 | : 14.9 | : 12.7 | : 16.7 | : | : 11.4 | : 19.3 | : 15.6 |
| 15 | : 9.3 | : 9.7 | : 11.0 | : | : 8.6 | : 14.1 | : 11.1 |
| 16 | : 3.0 | : 2.4 | : 5.7 | : | : 4.9 | : 4.1 | : 3.9 |
| 17 | : 1.9 | : 0.8 | : 4.8 | : | : 2.8 | : 2.6 | : 2.4 |
| 18 | : 1.5 | : 6.6 | : 3.6 | : | : 1.5 | : 2.3 | : 1.9 |
| 19 | : 0.7 | : 0.2 | : 3.3 | : | : 0.9 | : 1.0 | : 1.1 |
| 20 | : 0.7 | : | : 1.8 | : | : 0.3 | : 0.6 | : 0.6 |
| 21 | : 0.7 | : | : 0.9 | : | : 0.3 | : | : 0.3 |
| 22 | : 0.7 | : | : 0.6 | : | : | : | : 0.2 |
| 23 | : | : | : 0.3 | : | : | : | : 0.05 |
| 24 | : | : | : 0.3 | : | : | : | : 0.05 |

Visibility Distance:

70% of time, miles : 8.4 : 9.3 : 9.7 : : 9.0 : 8.9 : 9.1

Basis, number of

observations : 268 : 504 : 335 : : 324 : 694 : 2125

TABLE 14.

VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE ON JEFFERSON NATIONAL FOREST,
BY MONTHS AND HOURS OF DAY

Basis: 2,125 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| April | | 8.2 | 9.7 | | 9.4 | 10.1 | | 8.5 | 10.0 |
| May | | 9.2 | | | 9.9 | | | 9.7 | |
| October | 8.6 | | | 8.7 | | | 9.7 | | |
| November | 7.6 | 10.3 | 9.9 | 7.5 | 10.3 | 10.1 | 8.1 | 8.9 | 10.2 |

TABLE 15.

PERCENT OF TIME VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE EQUALS 6 MILES OR
MORE ON JEFFERSON NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 2,125 observations

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|----------|------------|------|------|------------|------|-------|------------|-------|-------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| April | | 96.3 | 97.4 | | 96.4 | 100.0 | | 95.6 | 100.0 |
| May | | 96.8 | | | 98.0 | | | 100.0 | |
| October | 95.8 | | | 93.4 | | | 96.7 | | |
| November | 88.3 | 94.6 | 92.7 | 82.3 | 98.8 | 98.3 | 86.9 | 97.4 | 98.2 |

TABLE 16.

PERCENT OF TIME STANDARD SMOKE IS VISIBLE ON THE JEFFERSON NATIONAL FOREST,
BY MONTHS

| Visibility Distance: | Month | | | | All | |
|----------------------|-------------------------|---------|---|----------|------------|---------|
| miles | :April | :May | : | :October | :November: | months |
| | Percent of time visible | | | | | |
| 1 | : 100.0 | : 100.0 | : | : 100.0 | : 100.0 | : 100.0 |
| 2 | : 100.0 | : 100.0 | : | : 100.0 | : 99.9 | : 99.9 |
| 3 | : 99.6 | : 99.7 | : | : 97.7 | : 95.7 | : 97.9 |
| 4 | : 97.4 | : 98.8 | : | : 95.3 | : 92.1 | : 95.4 |
| 5 | : 90.4 | : 95.0 | : | : 82.0 | : 82.6 | : 87.6 |
| 6 | : 74.4 | : 83.6 | : | : 70.3 | : 68.9 | : 73.9 |
| 7 | : 55.8 | : 65.7 | : | : 62.2 | : 53.5 | : 57.8 |
| 8 | : 31.4 | : 39.8 | : | : 44.2 | : 37.3 | : 36.9 |
| 9 | : 10.4 | : 18.9 | : | : 17.4 | : 21.5 | : 18.3 |
| 10 | : 3.4 | : 6.0 | : | : 10.5 | : 6.9 | : 6.0 |
| 11 | : 1.0 | : 3.7 | : | : 5.2 | : 2.4 | : 2.6 |
| 12 | : 0.4 | : 2.5 | : | : 1.7 | : 1.6 | : 1.5 |
| 13 | : | : 0.5 | : | : 0.6 | : 0.4 | : 0.3 |
| 14 | : | : | : | : | : 0.1 | : 0.1 |

| | | | | | | |
|----------------------|-----|---|-----|---|-----|-------------|
| Visibility Distance: | | | | | | |
| 70% of time, miles : | 6.2 | : | 6.8 | : | 6.0 | : 5.9 : 6.2 |

| | | | | | | |
|------------------|-----|---|-----|---|-----|--------------|
| Basis, number of | : | | | | | |
| observations : | 500 | : | 402 | : | 172 | : 697 : 1771 |

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be carefully documented to ensure the integrity of the financial data.

2. The second part of the document outlines the various methods used to collect and analyze data. It includes a detailed description of the sampling process, which involves selecting a representative group of individuals from the population.

3. The third part of the document presents the results of the study. It shows that there is a significant correlation between the variables being studied, which supports the hypothesis that was tested.

4. The fourth part of the document discusses the limitations of the study and suggests areas for future research. It notes that while the study provides valuable insights, there are still some factors that need to be explored in more detail.

5. The fifth part of the document concludes the study by summarizing the key findings and their implications. It states that the results of the study have important implications for the field of research and that further work is needed to fully understand the phenomena being studied.

The following table provides a summary of the data collected during the study. It shows the mean values for each variable and the standard deviation, which is a measure of the spread of the data.

| Variable | Mean | Standard Deviation |
|------------|------|--------------------|
| Variable 1 | 12.5 | 3.2 |
| Variable 2 | 8.7 | 2.1 |
| Variable 3 | 15.3 | 4.5 |
| Variable 4 | 9.8 | 2.8 |
| Variable 5 | 11.2 | 3.5 |

The data shows that the mean values for the variables are relatively low, with the highest mean being for Variable 3. The standard deviations are also relatively low, indicating that the data is fairly consistent.

The following figure shows a scatter plot of the data, which illustrates the relationship between the variables. The plot shows a positive correlation between the variables, which is consistent with the findings of the study.

TABLE 17.

VISIBILITY DISTANCE OF STANDARD SMOKE ON JEFFERSON NATIONAL FOREST,
BY MONTHS AND HOURS OF DAY

Basis: 1,771 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| April | | 5.4 | 6.4 | | 6.3 | 6.9 | | 5.5 | 6.7 |
| May | | 6.2 | | | 6.8 | | | 6.7 | |
| October | 5.7 | | | 5.7 | | | 6.6 | | |
| November | 4.9 | 6.9 | 6.9 | 5.1 | 6.9 | 6.7 | 5.5 | 5.9 | 7.8 |

TABLE 18.

PERCENT OF TIME VISIBILITY DISTANCE OF STANDARD SMOKE EQUALS 6 MILES OR
MORE ON JEFFERSON NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 1,771 observations

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| April | | 58.8 | 79.7 | | 75.9 | 90.2 | | 59.3 | 83.5 |
| May | | 72.8 | | | 84.5 | | | 82.0 | |
| October | 66.7 | | | 66.1 | | | 77.4 | | |
| November | 48.9 | 74.6 | 81.8 | 56.8 | 79.8 | 78.7 | 60.6 | 68.8 | 87.7 |

TABLE 19.

PERCENT OF TIME EIGHTH-ACRE SMOKE IS VISIBLE ON THE MONONGAHELA NATIONAL FOREST, BY MONTHS

| Visibility Distance: miles | Month | | | | | | | | | | | | All months |
|-------------------------------|-------------------------|--------|-------|-------|-------|---------|--------|-------|-------|-------|-------|-------|---------------|
| | :March | :April | :May | :June | :July | :August | :Sept. | :Oct. | :Nov. | : | : | : | |
| | Percent of time visible | | | | | | | | | | | | |
| 1 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | : 100.0 |
| 2 | 100.0 | 99.9 | 100.0 | 99.8 | 100.0 | 99.5 | 100.0 | 99.8 | 99.8 | 98.7 | 98.7 | 98.7 | : 99.6 |
| 3 | 100.0 | 98.7 | 99.5 | 98.8 | 98.3 | 95.7 | 100.0 | 98.6 | 94.3 | 94.3 | 94.3 | 94.3 | : 97.7 |
| 4 | 97.6 | 95.7 | 96.5 | 92.6 | 96.1 | 88.9 | 98.1 | 95.0 | 88.4 | 88.4 | 88.4 | 88.4 | : 93.6 |
| 5 | 97.0 | 93.0 | 94.3 | 90.2 | 93.0 | 81.7 | 97.1 | 90.1 | 84.1 | 84.1 | 84.1 | 84.1 | : 90.1 |
| 6 | 89.9 | 85.6 | 90.0 | 80.0 | 85.6 | 70.2 | 93.7 | 78.1 | 74.0 | 74.0 | 74.0 | 74.0 | : 81.4 |
| 7 | 76.9 | 76.8 | 81.8 | 69.3 | 70.0 | 53.4 | 90.8 | 63.0 | 61.7 | 61.7 | 61.7 | 61.7 | : 70.0 |
| 8 | 57.4 | 60.7 | 69.3 | 53.1 | 53.0 | 41.3 | 85.4 | 46.5 | 48.7 | 48.7 | 48.7 | 48.7 | : 55.5 |
| 9 | 42.0 | 45.4 | 58.5 | 36.7 | 38.7 | 38.5 | 72.3 | 35.6 | 37.9 | 37.9 | 37.9 | 37.9 | : 43.4 |
| 10 | 30.8 | 31.1 | 45.3 | 20.1 | 27.0 | 28.8 | 61.2 | 25.8 | 28.6 | 28.6 | 28.6 | 28.6 | : 31.7 |
| 11 | 23.1 | 23.9 | 35.6 | 13.1 | 17.0 | 20.2 | 49.0 | 19.0 | 23.6 | 23.6 | 23.6 | 23.6 | : 24.3 |
| 12 | 14.2 | 15.2 | 23.7 | 3.6 | 11.3 | 17.3 | 24.3 | 13.3 | 18.1 | 18.1 | 18.1 | 18.1 | : 16.1 |
| 13 | 10.1 | 9.2 | 13.6 | 2.1 | 3.0 | 5.8 | 10.2 | 8.5 | 13.1 | 13.1 | 13.1 | 13.1 | : 9.8 |
| 14 | 5.3 | 7.7 | 10.6 | 1.2 | 1.7 | 3.8 | 7.3 | 6.5 | 10.6 | 10.6 | 10.6 | 10.6 | : 7.6 |
| 15 | : | 4.8 | 7.1 | : | 1.3 | 2.4 | 3.4 | 4.1 | 7.4 | 7.4 | 7.4 | 7.4 | : 4.8 |
| 16 | : | 2.1 | 3.4 | : | : | 1.0 | 1.5 | 2.2 | 4.7 | 4.7 | 4.7 | 4.7 | : 2.6 |
| 17 | : | 1.4 | 1.3 | : | : | : | 1.0 | 1.2 | 2.6 | 2.6 | 2.6 | 2.6 | : 1.3 |
| 18 | : | 1.1 | 1.1 | : | : | : | 0.5 | 0.6 | 1.1 | 1.1 | 1.1 | 1.1 | : 0.8 |
| 19 | : | 0.1 | 0.8 | : | : | : | : | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | : 0.3 |
| 20 | : | 0.1 | 0.7 | : | : | : | : | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | : 0.2 |
| 21 | : | : | 0.5 | : | : | : | : | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | : 0.1 |
| 22 | : | : | 0.3 | : | : | : | : | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | : 0.1 |
| 23 | : | : | : | : | : | : | : | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | : 0.02 |
| 24 | : | : | : | : | : | : | : | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | : 0.02 |

Visibility Distance:
70% of time, miles : 7.4 : 7.4 : 7.4 : 7.9 : 6.9 : 7.0 : 6.0 : 9.2 : 6.5 : 6.3 : 7.0

Basis, number of
observations : 169 : 1013 : 848 : 420 : 230 : 208 : 206 : 1108 : 1307 : 5509

1. The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $\epsilon \rightarrow 0$. It is shown that the solutions of the system (1) converge to the solutions of the system (2) in the sense of the weak convergence in the space $L^2(\Omega; \mathbb{R}^n)$.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion. The number of people aged 65 and over is expected to increase from 250 million to 450 million. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion.

[illegible]

Figure 1. The effect of the number of trials on the number of correct responses. The number of correct responses was significantly higher than the number of incorrect responses in all cases. The number of correct responses was significantly higher than the number of incorrect responses in all cases. The number of correct responses was significantly higher than the number of incorrect responses in all cases.

TABLE 20.

VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE ON THE MONONGAHELA NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 5,509 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|-----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| March | | | 6.8 | | | 7.8 | | | 7.3 |
| April | | 6.1 | 7.3 | | 7.0 | 8.0 | | 6.5 | 7.9 |
| May | | 7.4 | 8.6 | | 8.0 | 9.2 | | 7.4 | 9.2 |
| June | | 6.4 | | | 7.2 | | | 7.1 | |
| July | | 6.5 | | | 7.6 | | | 6.9 | |
| August | | 5.9 | | | 6.3 | | | 5.5 | |
| September | | 8.4 | | | 9.6 | | | 9.2 | |
| October | 6.1 | 6.7 | 6.1 | 7.0 | 6.4 | 6.8 | 7.1 | 6.2 | 6.5 |
| November | 4.3 | 6.6 | 7.1 | 5.0 | 6.9 | 8.1 | 4.7 | 6.2 | 7.4 |

TABLE 21.

PERCENT OF TIME VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE EQUALS 6 MILES OR MORE ON THE MONONGAHELA NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 5,509 observations

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|-----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| March | | | 85.7 | | | 94.7 | | | 88.9 |
| April | | 70.6 | 89.8 | | 77.6 | 94.4 | | 74.6 | 93.0 |
| May | | 83.0 | 96.9 | | 91.8 | 97.9 | | 84.2 | 95.8 |
| June | | 74.4 | | | 85.6 | | | 79.7 | |
| July | | 77.0 | | | 92.5 | | | 86.8 | |
| August | | 67.7 | | | 76.7 | | | 65.8 | |
| September | | 91.4 | | | 90.5 | | | 96.8 | |
| October | 71.3 | 82.4 | 71.4 | 79.8 | 75.0 | 84.5 | 86.3 | 74.0 | 76.9 |
| November | 54.7 | 80.3 | 79.3 | 59.7 | 84.7 | 88.4 | 57.3 | 73.2 | 89.2 |

TABLE 22.

PERCENT OF TIME STANDARD SMOKE IS VISIBLE ON THE MONONGAHELA NATIONAL FOREST, BY MONTHS

| Visibility Distance: miles | Month | | | | | | | | | | | | All months | |
|-------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|--|
| | March | April | May | June | July | August | Sept. | Oct. | Nov. | | | | | |
| | Percent of time visible | | | | | | | | | | | | | |
| 1 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | |
| 2 | : 100.0 | : 99.2 | : 100.0 | : 98.8 | : 99.6 | : 96.1 | : 100.0 | : 98.4 | : 95.8 | : 95.8 | : 95.8 | : 95.8 | : 98.3 | |
| 3 | : 97.6 | : 94.4 | : 95.0 | : 92.0 | : 96.1 | : 84.1 | : 97.3 | : 90.8 | : 86.4 | : 86.4 | : 86.4 | : 86.4 | : 91.5 | |
| 4 | : 89.9 | : 86.0 | : 89.6 | : 81.4 | : 86.5 | : 71.0 | : 92.9 | : 78.1 | : 74.0 | : 74.0 | : 74.0 | : 74.0 | : 81.6 | |
| 5 | : 66.8 | : 67.8 | : 75.4 | : 62.8 | : 63.5 | : 45.4 | : 86.4 | : 51.6 | : 53.4 | : 53.4 | : 53.4 | : 53.4 | : 61.4 | |
| 6 | : 44.4 | : 46.3 | : 59.6 | : 37.9 | : 39.1 | : 38.2 | : 70.6 | : 35.7 | : 38.1 | : 38.1 | : 38.1 | : 38.1 | : 43.7 | |
| 7 | : 31.3 | : 27.7 | : 43.9 | : 18.4 | : 24.8 | : 26.1 | : 54.4 | : 22.6 | : 26.7 | : 26.7 | : 26.7 | : 26.7 | : 29.0 | |
| 8 | : 15.4 | : 15.7 | : 26.1 | : 3.9 | : 11.3 | : 16.9 | : 28.2 | : 13.2 | : 18.0 | : 18.0 | : 18.0 | : 18.0 | : 16.7 | |
| 9 | : 7.1 | : 8.5 | : 12.7 | : 2.2 | : 1.7 | : 3.9 | : 9.2 | : 7.4 | : 11.9 | : 11.9 | : 11.9 | : 11.9 | : 8.8 | |
| 10 | : : | : 3.6 | : 4.9 | : : | : 0.9 | : 1.4 | : 1.1 | : 3.2 | : 5.8 | : 5.8 | : 5.8 | : 5.8 | : 3.6 | |
| 11 | : : | : 1.4 | : 1.1 | : : | : : | : : | : 0.5 | : 1.2 | : 2.6 | : 2.6 | : 2.6 | : 2.6 | : 1.3 | |
| 12 | : : | : 1.0 | : 0.7 | : : | : : | : : | : : | : 0.5 | : 0.6 | : 0.6 | : 0.6 | : 0.6 | : 0.5 | |
| 13 | : : | : 0.1 | : : | : : | : : | : : | : : | : 0.2 | : 0.2 | : 0.2 | : 0.2 | : 0.2 | : 0.1 | |
| 14 | : : | : : | : : | : : | : : | : : | : : | : 0.1 | : 0.1 | : 0.1 | : 0.1 | : 0.1 | : 0.02 | |

Visibility Distance:

70% of time, miles : 4.9 : 4.9 : 5.3 : 4.6 : 4.7 : 4.0 : 6.0 : 4.3 : 4.2 : 4.6

Basis, number of

observations : 169 : 1014 : 834 : 414 : 230 : 207 : 184 : 1115 : 1298 : 5,465

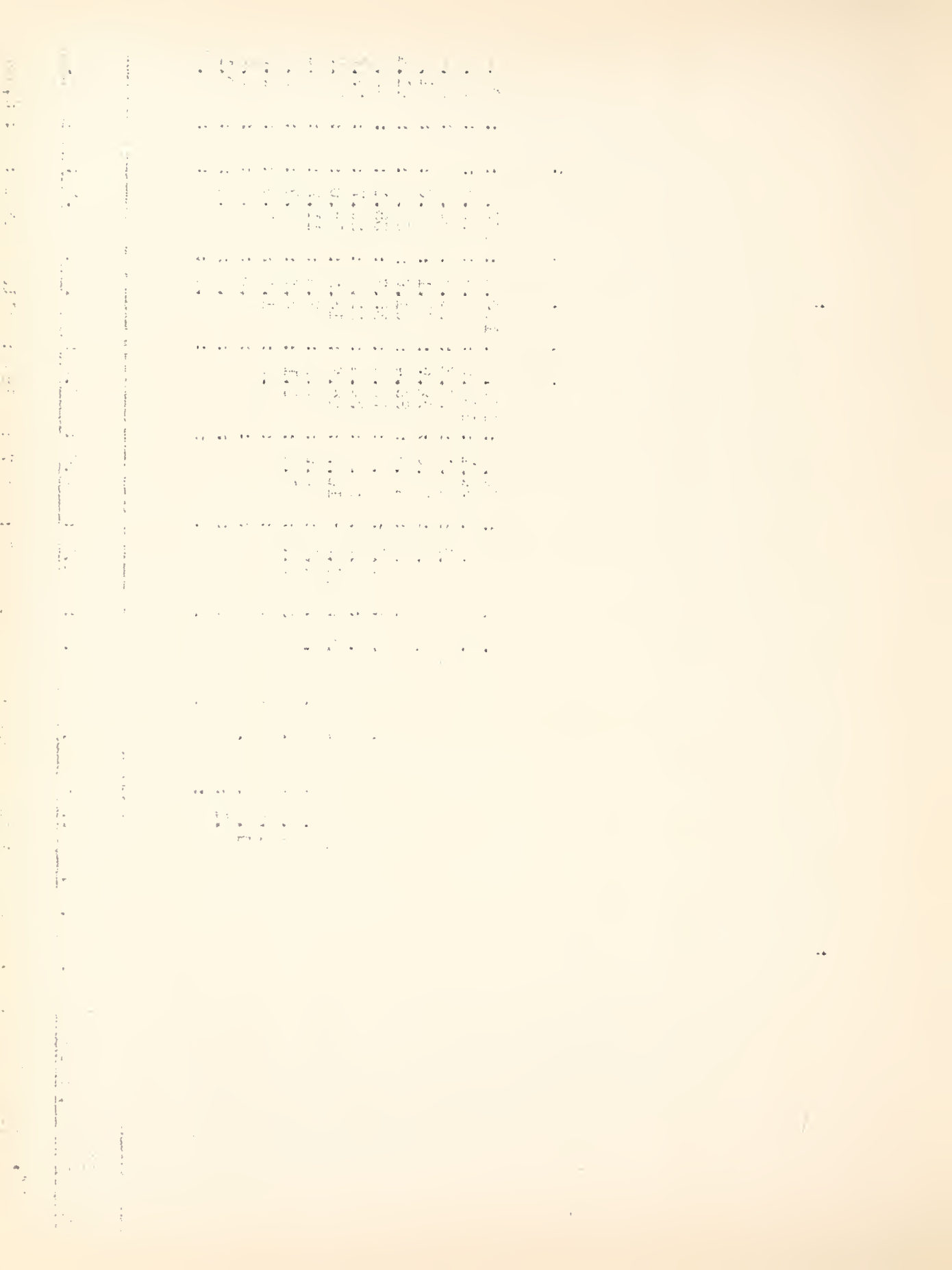


TABLE 23.

VISIBILITY DISTANCE OF STANDARD SMOKE ON THE MONONGAHELA NATIONAL FOREST,
BY MONTHS AND HOURS OF DAY

Basis: 5,465 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|-----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| March | | | 4.5 | | | 5.4 | | | 4.7 |
| April | | 4.0 | 4.8 | | 4.4 | 5.4 | | 4.5 | 5.2 |
| May | | 4.9 | 5.8 | | 5.3 | 6.3 | | 4.9 | 6.4 |
| June | | 4.4 | | | 4.7 | | | 4.6 | |
| July | | 4.4 | | | 5.0 | | | 4.7 | |
| August | | 3.9 | | | 4.2 | | | 4.0 | |
| September | | 5.5 | | | 6.7 | | | 6.2 | |
| October | 4.1 | 4.4 | 4.1 | 4.6 | 4.1 | 4.5 | 4.7 | 4.1 | 4.3 |
| November | 3.0 | 4.4 | 4.6 | 3.4 | 4.6 | 5.2 | 2.9 | 4.2 | 4.8 |

TABLE 24.

PERCENT OF TIME VISIBILITY DISTANCE OF STANDARD SMOKE EQUALS 6 MILES OR
MORE ON THE MONONGAHELA NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 5,465 observations

| Month | 9:00 A. M. | | | 12:00 noon | | | 4:00 P. M. | | |
|-----------|------------|------|------|------------|------|------|------------|------|------|
| | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| March | | | 32.6 | | | 53.4 | | | 45.2 |
| April | | 36.4 | 39.8 | | 48.0 | 56.6 | | 43.2 | 48.4 |
| May | | 49.1 | 67.0 | | 59.4 | 74.5 | | 48.9 | 76.8 |
| June | | 29.9 | | | 44.3 | | | 38.8 | |
| July | | 28.8 | | | 43.8 | | | 44.2 | |
| August | | 38.7 | | | 38.4 | | | 37.5 | |
| September | | 57.9 | | | 76.5 | | | 76.2 | |
| October | 33.0 | 32.9 | 30.6 | 45.9 | 33.8 | 35.5 | 40.1 | 35.1 | 33.6 |
| November | 26.3 | 35.3 | 46.4 | 29.6 | 44.0 | 56.1 | 26.8 | 34.3 | 43.2 |

TABLE 25.

PERCENT OF TIME EIGHTH-ACRE SMOKE IS VISIBLE ON THE WHITE MOUNTAIN NATIONAL FOREST, BY MONTHS

| Visibility Distance: miles | :May | :June | :July Percent of time visible | Month August | :Sept. | :Oct. | :Nov. | :All months |
|-------------------------------|---------|---------|----------------------------------|-----------------|---------|---------|---------|----------------|
| | | | | | | | | |
| 1 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 |
| 2 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 100.0 | : 99.9 |
| 3 | : 99.2 | : 100.0 | : 100.0 | : 99.8 | : 100.0 | : 100.0 | : 100.0 | : 99.9 |
| 4 | : 98.8 | : 99.4 | : 98.6 | : 98.4 | : 99.7 | : 99.3 | : 99.5 | : 99.1 |
| 5 | : 97.9 | : 99.0 | : 96.8 | : 97.0 | : 99.5 | : 98.6 | : 99.5 | : 98.3 |
| 6 | : 96.7 | : 97.3 | : 93.4 | : 92.3 | : 95.0 | : 97.6 | : 98.9 | : 95.6 |
| 7 | : 95.9 | : 95.8 | : 90.8 | : 86.7 | : 91.7 | : 95.2 | : 96.8 | : 92.8 |
| 8 | : 92.2 | : 92.0 | : 85.0 | : 77.6 | : 83.6 | : 90.8 | : 91.6 | : 86.9 |
| 9 | : 84.8 | : 88.0 | : 75.4 | : 66.1 | : 73.0 | : 80.9 | : 88.9 | : 78.8 |
| 10 | : 78.7 | : 82.9 | : 69.1 | : 61.0 | : 68.8 | : 74.1 | : 87.4 | : 73.6 |
| 11 | : 74.6 | : 80.2 | : 62.1 | : 57.0 | : 65.5 | : 69.6 | : 85.8 | : 69.9 |
| 12 | : 71.7 | : 76.6 | : 55.2 | : 51.9 | : 62.0 | : 62.4 | : 82.1 | : 65.0 |
| 13 | : 55.3 | : 69.2 | : 43.1 | : 37.8 | : 51.6 | : 47.1 | : 70.0 | : 53.0 |
| 14 | : 50.4 | : 66.2 | : 37.3 | : 31.1 | : 47.6 | : 44.0 | : 65.8 | : 48.5 |
| 15 | : 43.8 | : 61.0 | : 28.9 | : 26.6 | : 39.8 | : 33.1 | : 56.8 | : 41.5 |
| 16 | : 34.4 | : 50.6 | : 21.7 | : 21.0 | : 35.0 | : 27.0 | : 49.5 | : 34.1 |
| 17 | : 27.9 | : 40.9 | : 15.6 | : 14.0 | : 29.0 | : 24.6 | : 39.5 | : 27.2 |
| 18 | : 19.7 | : 31.6 | : 8.7 | : 8.9 | : 24.4 | : 20.1 | : 30.5 | : 20.5 |
| 19 | : 17.6 | : 26.4 | : 6.6 | : 6.8 | : 18.4 | : 19.1 | : 25.8 | : 17.0 |
| 20 | : 15.2 | : 20.2 | : 4.3 | : 5.1 | : 15.9 | : 16.0 | : 17.9 | : 13.4 |
| 21 | : 5.7 | : 11.0 | : 2.6 | : 3.3 | : 13.4 | : 15.7 | : 13.7 | : 9.1 |
| 22 | : 5.3 | : 5.7 | : 1.7 | : 3.0 | : 12.3 | : 14.0 | : 11.0 | : 7.1 |
| 23 | : 4.9 | : 3.8 | : 0.6 | : 2.1 | : 3.8 | : 10.2 | : 10.0 | : 4.4 |
| 24 | : 4.5 | : 2.5 | : | : 1.4 | : 2.3 | : 2.0 | : 6.3 | : 2.3 |
| 25 | : | : 1.9 | : | : 0.7 | : 2.3 | : 1.7 | : 5.3 | : 1.5 |
| 26 | : | : 0.6 | : | : 0.5 | : 2.3 | : 1.7 | : 3.2 | : 1.0 |
| 27 | : | : 0.2 | : | : 0.2 | : 1.5 | : | : 1.6 | : 0.4 |
| 28 | : | : | : | : | : 0.5 | : | : 1.0 | : 0.2 |
| 29 | : | : | : | : | : | : | : 0.5 | : 0.1 |

| | | | | | | | | |
|----------------------------------|--------|--------|-------|-------|-------|--------|--------|---------|
| Visibility Distance: | | | | | | | | |
| 70% of time, Miles: | : 12.1 | : 12.9 | : 9.9 | : 8.7 | : 7.7 | : 10.9 | : 13.0 | : 11.0 |
| Basis, number of Observations | : 244 | : 526 | : 346 | : 428 | : 397 | : 293 | : 190 | : 2,424 |

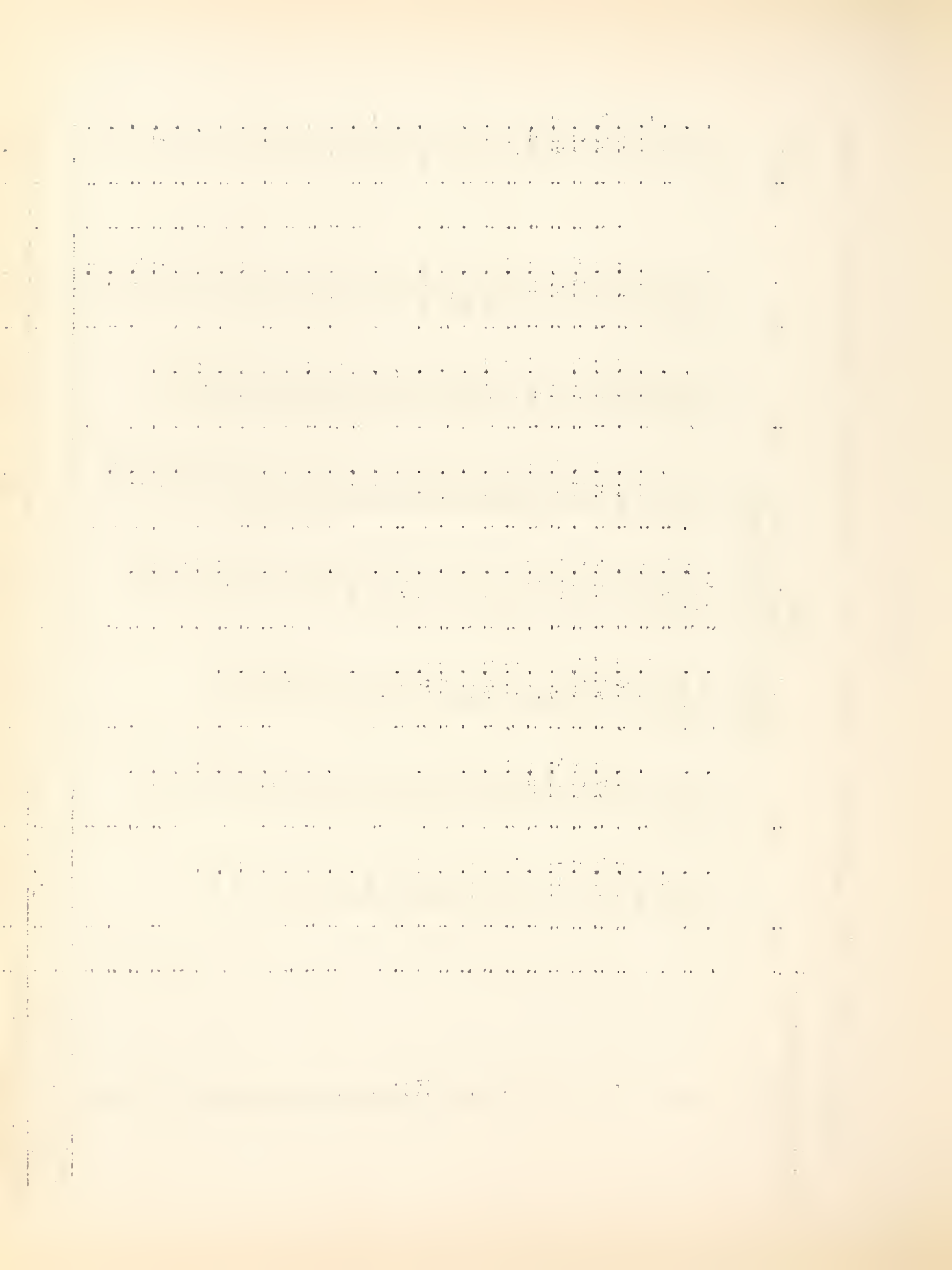


TABLE 26.

VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE ON THE WHITE MOUNTAIN NATIONAL
FOREST, BY MONTHS AND HOURS OF DAY

Basis: 2,424 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | 12:00 noon | | 4:00 P. M. | |
|-----------|------------|------|------------|------|------------|------|
| | 1937 | 1938 | 1937 | 1938 | 1937 | 1938 |
| June | 12.6 | 12.3 | 14.4 | 14.1 | 12.1 | 14.0 |
| July | 9.7 | | 10.1 | | 9.7 | |
| August | 8.2 | | 8.6 | | 9.3 | |
| September | 9.1 | | 10.1 | | 10.1 | |
| October | 11.0 | | 11.5 | | 10.1 | |

TABLE 27.

PERCENT OF TIME VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKE EQUALS 6 MILES
OR MORE ON THE WHITE MOUNTAIN NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 2,424 observations

| Month | 9:00 A. M. | | 12:00 noon | | 4:00 P. M. | |
|-----------|------------|------|------------|------|------------|------|
| | 1937 | 1938 | 1937 | 1938 | 1937 | 1938 |
| June | 97.8 | 94.9 | 96.8 | 96.5 | 100.0 | 97.6 |
| July | 94.4 | | 94.8 | | 91.0 | |
| August | 91.9 | | 89.9 | | 95.1 | |
| September | 93.2 | | 96.9 | | 94.8 | |
| October | 96.8 | | 100.0 | | 96.0 | |

TABLE 28.

PERCENT OF TIME STANDARD SMOKE IS VISIBLE ON THE WHITE MOUNTAIN NATIONAL
FOREST, BY MONTHS

| Visibility Distance: | Month | | | | | All |
|----------------------|-------------------------|--------|---------|------------|----------|---------|
| miles | :June | :July | :August | :September | :October | :months |
| | Percent of time visible | | | | | |
| 1 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 | :100.0 |
| 2 | : 99.8 | : 99.6 | : 99.5 | :100.0 | :100.0 | : 99.8 |
| 3 | : 99.2 | : 96.4 | : 97.4 | : 99.3 | : 99.0 | : 98.4 |
| 4 | : 96.8 | : 92.1 | : 91.6 | : 94.6 | : 97.9 | : 94.6 |
| 5 | : 92.5 | : 85.7 | : 80.1 | : 85.6 | : 93.1 | : 87.4 |
| 6 | : 87.5 | : 73.7 | : 66.3 | : 72.1 | : 81.3 | : 76.6 |
| 7 | : 81.2 | : 65.7 | : 60.2 | : 66.6 | : 73.4 | : 70.0 |
| 8 | : 76.3 | : 54.2 | : 52.2 | : 61.5 | : 63.7 | : 62.4 |
| 9 | : 66.5 | : 37.7 | : 33.5 | : 49.4 | : 47.4 | : 43.2 |
| 10 | : 56.3 | : 24.6 | : 24.4 | : 37.6 | : 31.1 | : 36.6 |
| 11 | : 40.4 | : 13.1 | : 14.1 | : 28.6 | : 26.0 | : 26.0 |
| 12 | : 28.4 | : 7.0 | : 7.7 | : 20.0 | : 21.1 | : 17.5 |
| 13 | : 16.5 | : 2.8 | : 3.5 | : 13.8 | : 16.3 | : 10.7 |
| 14 | : 4.7 | : 1.7 | : 2.3 | : 11.0 | : 10.7 | : 5.8 |
| 15 | : 2.2 | : | : 1.9 | : 8.8 | : | : 2.7 |
| 16 | : 0.6 | : | : 0.7 | : 2.2 | : | : 0.7 |
| 17 | : | : | : | : 1.0 | : | : 0.2 |

| | | | | | | |
|----------------------|-----|-------|-------|-------|-------|-------|
| Visibility Distance: | | | | | | |
| 70% of time, miles : | 8.6 | : 6.5 | : 5.7 | : 6.4 | : 7.3 | : 7.0 |

| | | | | | | |
|------------------|-----|-------|-------|-------|-------|---------|
| Basis, number of | : | | | | | |
| observations : | 535 | : 358 | : 427 | : 399 | : 289 | : 2,008 |

TABLE 29.

VISIBILITY DISTANCE OF STANDARD SMOKE ON THE WHITE MOUNTAIN NATIONAL FOREST,
BY MONTHS AND HOURS OF DAY

Basis: 2,008 observations

Visibility in Miles 70% of Time

| Month | 9:00 A. M. | | 12:00 noon | | 4:00 P. M. | |
|-----------|------------|------|------------|------|------------|------|
| | 1937 | 1938 | 1937 | 1938 | 1937 | 1938 |
| June | 8.9 | 8.0 | 9.0 | 9.0 | 8.0 | 9.1 |
| July | 6.6 | | 6.7 | | 6.1 | |
| August | 5.4 | | 5.7 | | 6.2 | |
| September | 6.0 | | 6.3 | | 6.8 | |
| October | 7.8 | | 7.6 | | 7.0 | |

TABLE 30.

PERCENT OF TIME VISIBILITY DISTANCE OF STANDARD SMOKE EQUALS 6 MILES OR
MORE ON THE WHITE MOUNTAIN NATIONAL FOREST, BY MONTHS AND HOURS OF DAY

Basis: 2,008 observations

| Month | 9:00 A. M. | | 12:00 noon | | 4:00 P. M. | |
|-----------|------------|------|------------|------|------------|------|
| | 1937 | 1938 | 1937 | 1938 | 1937 | 1938 |
| June | 91.0 | 82.7 | 88.8 | 88.2 | 86.7 | 86.9 |
| July | 73.9 | | 76.7 | | 70.8 | |
| August | 61.3 | | 66.0 | | 71.3 | |
| September | 69.7 | | 71.4 | | 75.4 | |
| October | 82.8 | | 81.6 | | 79.6 | |

FIGURE 1

VISIBILITY DISTANCES OF STANDARD AND EIGHTH-ACRE SMOKE COLUMNS

White Mountain National Forest, New Hampshire

Basis: 2216 observations

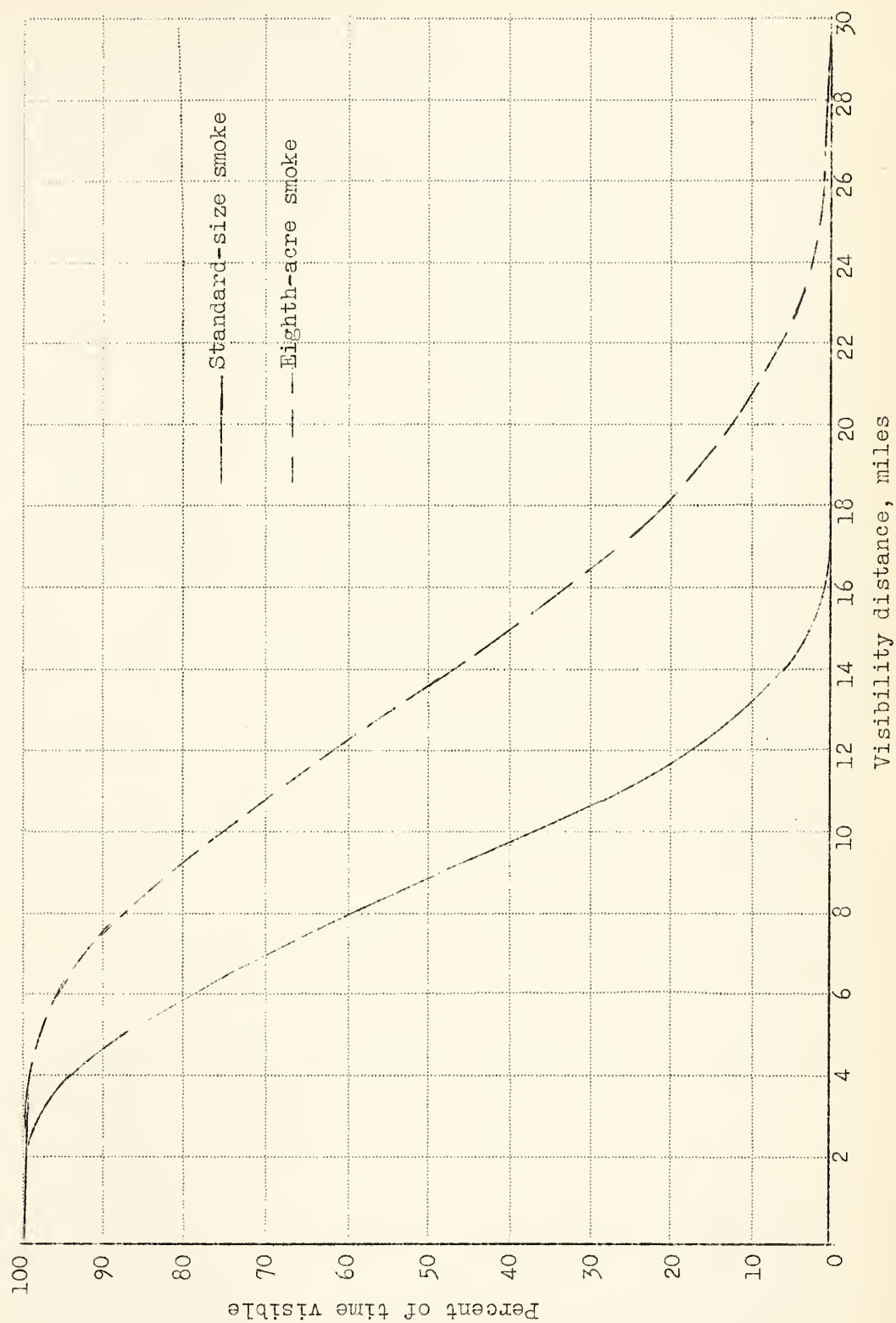


FIGURE 2

VISIBILITY DISTANCE OF STANDARD AND EIGHTH-ACRE SMOKE COLUMNS

Jefferson National Forest, Virginia

Basis: 6673 observations

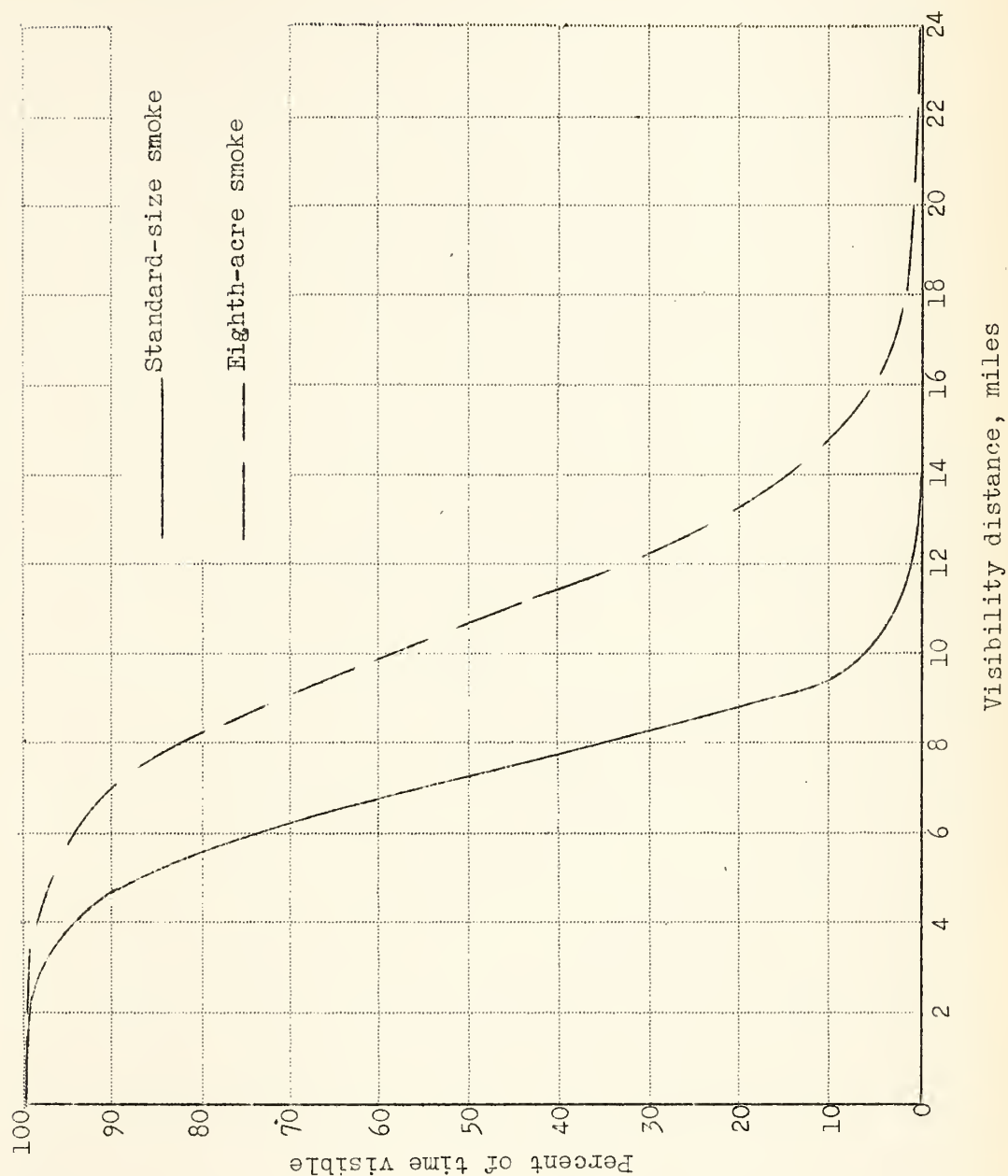


FIGURE 5

VISIBILITY DISTANCES OF STANDARD AND EIGHTH-ACRE SMOKE COLUMNS

George Washington National Forest, Virginia

Basis: 4181 observations

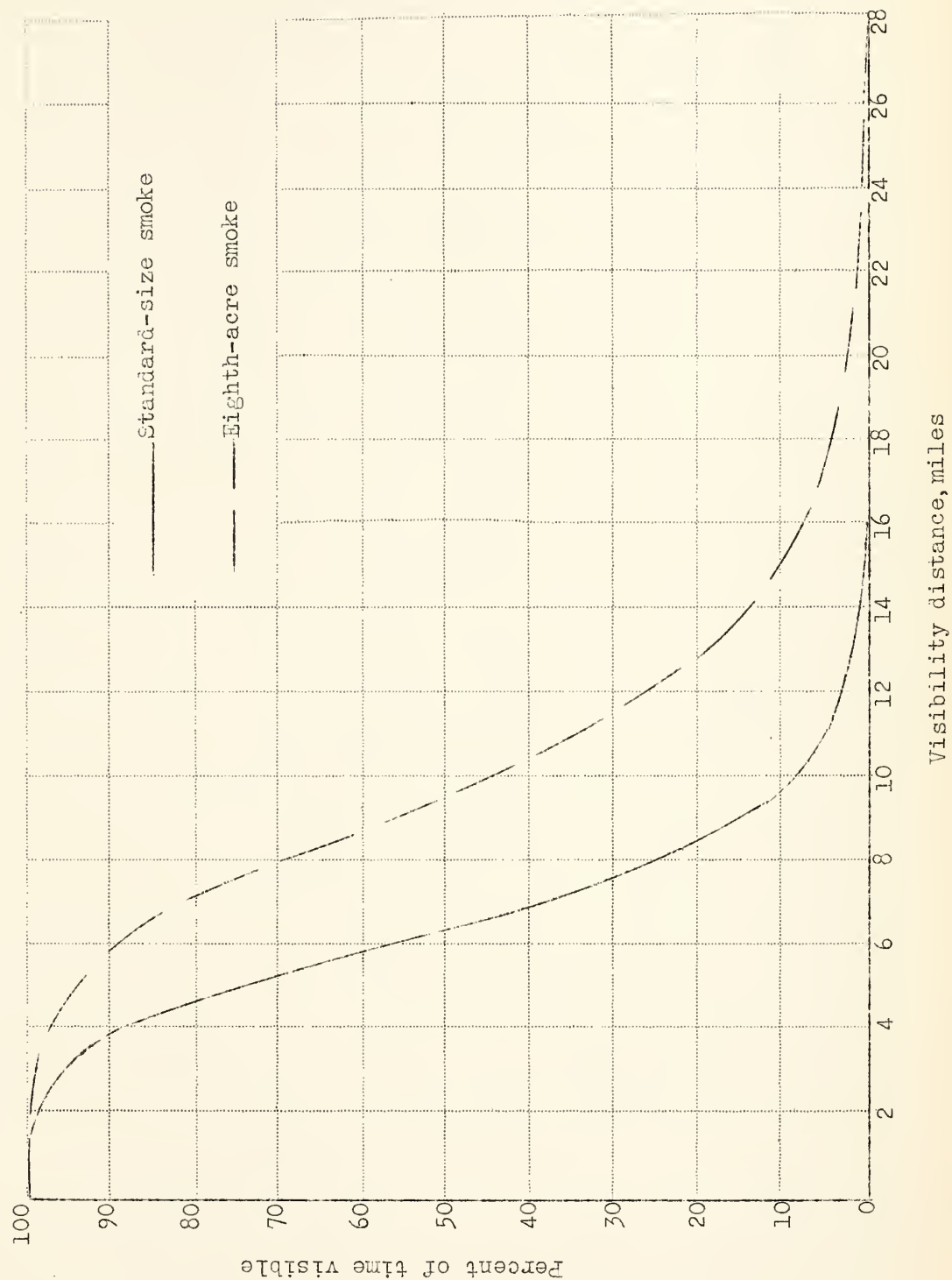


FIGURE 4

VISIBILITY DISTANCES OF STANDARD AND EIGHTH-ACRE SMOKE COLUMNS

Monongahela National Forest, West Virginia

Basis: 5487 observations

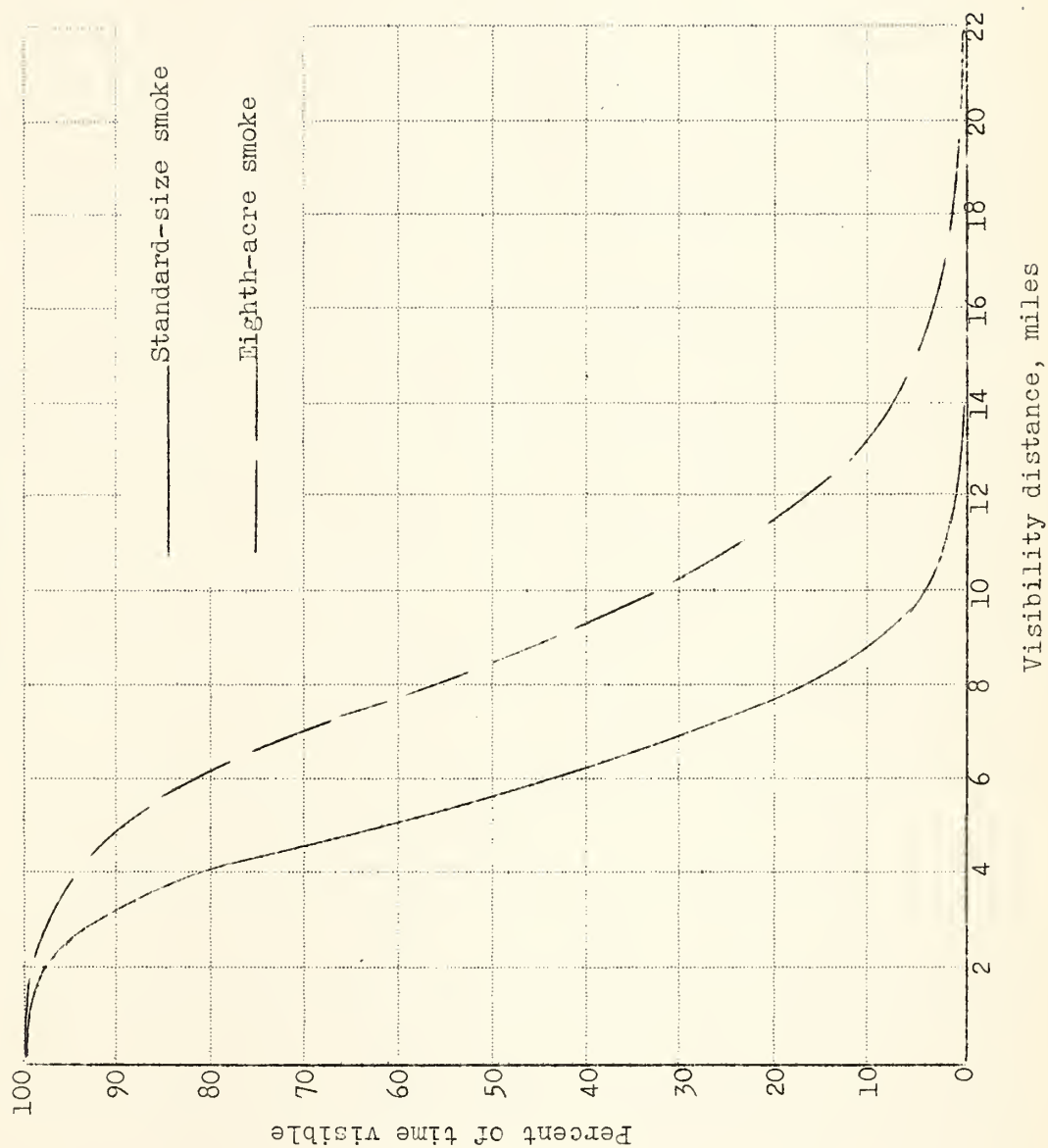


FIGURE 5

VISIBILITY DISTANCES OF STANDARD AND EIGHTH-ACRE SMOKE
COLUMNS

Cumberland National Forest, Kentucky

Basis: 6673 observations

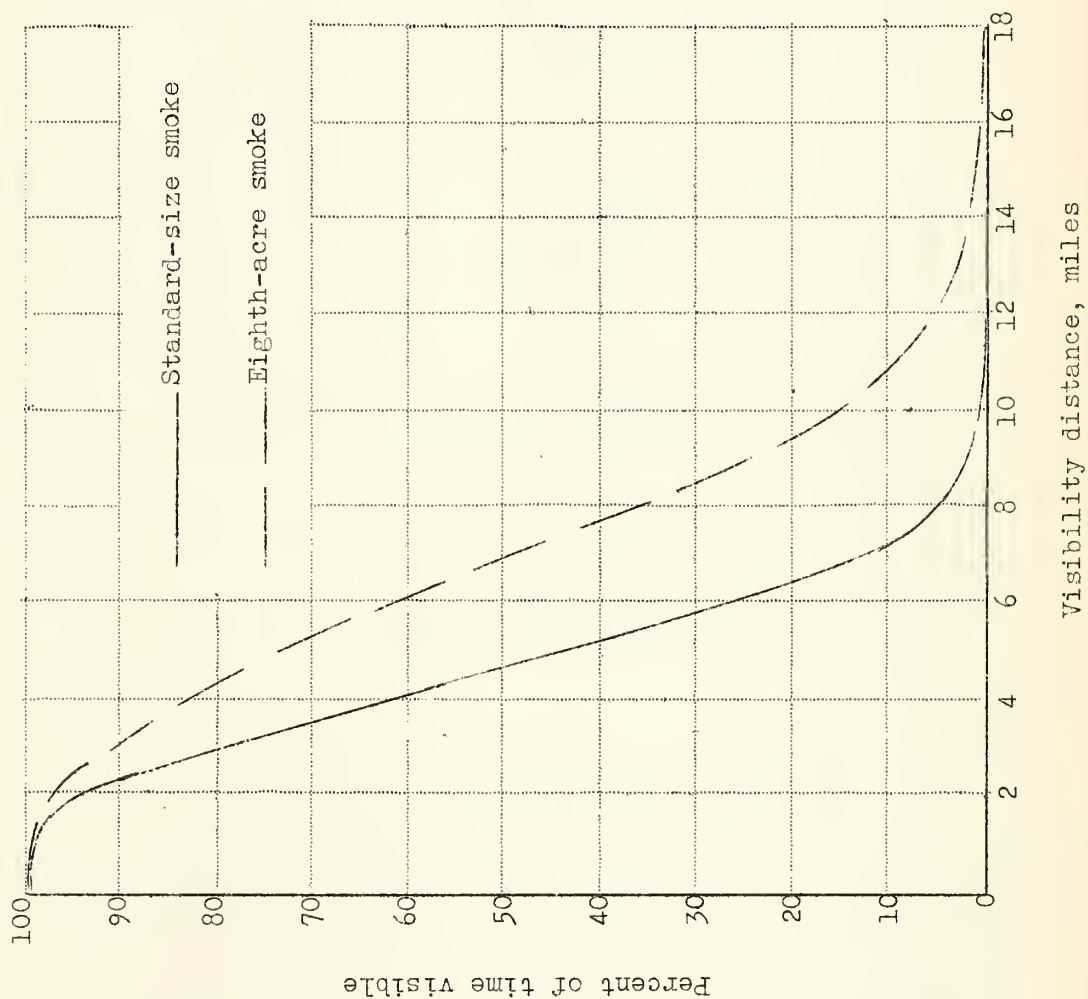


FIGURE 6

VISIBILITY DISTANCE 70 PERCENT OF TIME ON FIVE NATIONAL FORESTS

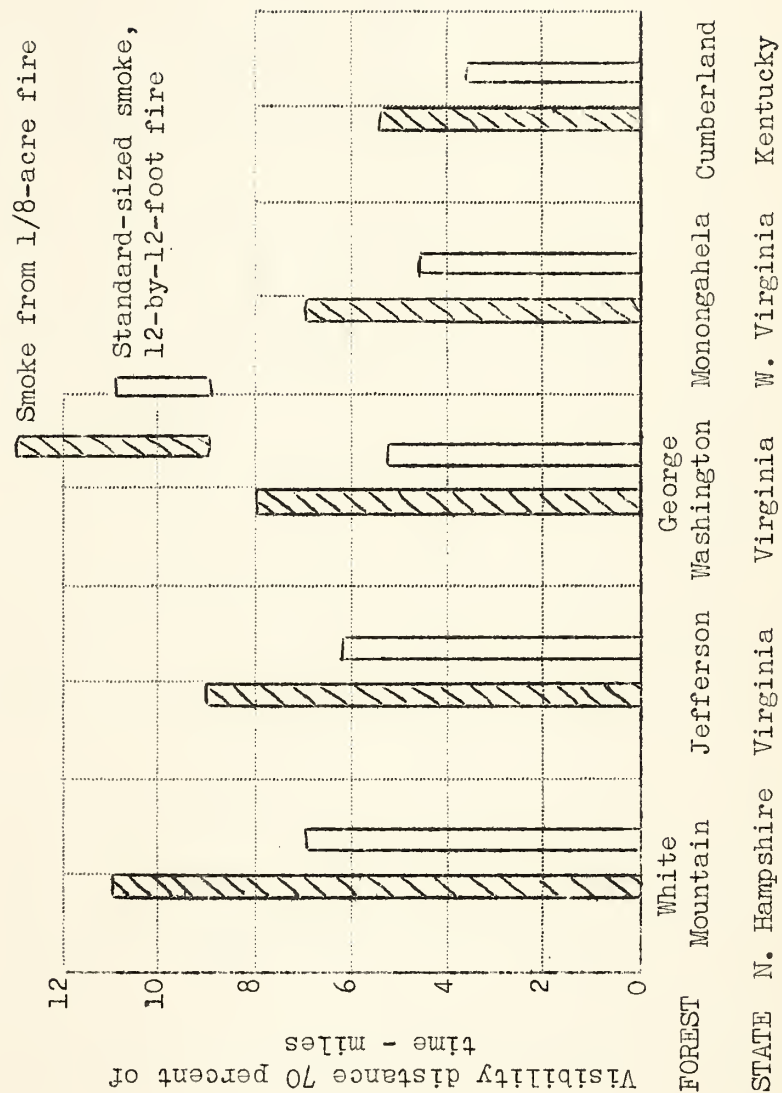


FIGURE 7

VISIBILITY DISTANCE 70 PERCENT OF THE TIME, BY MONTHS, FOR FIVE EASTERN NATIONAL FORESTS

Eighth-acre smokes

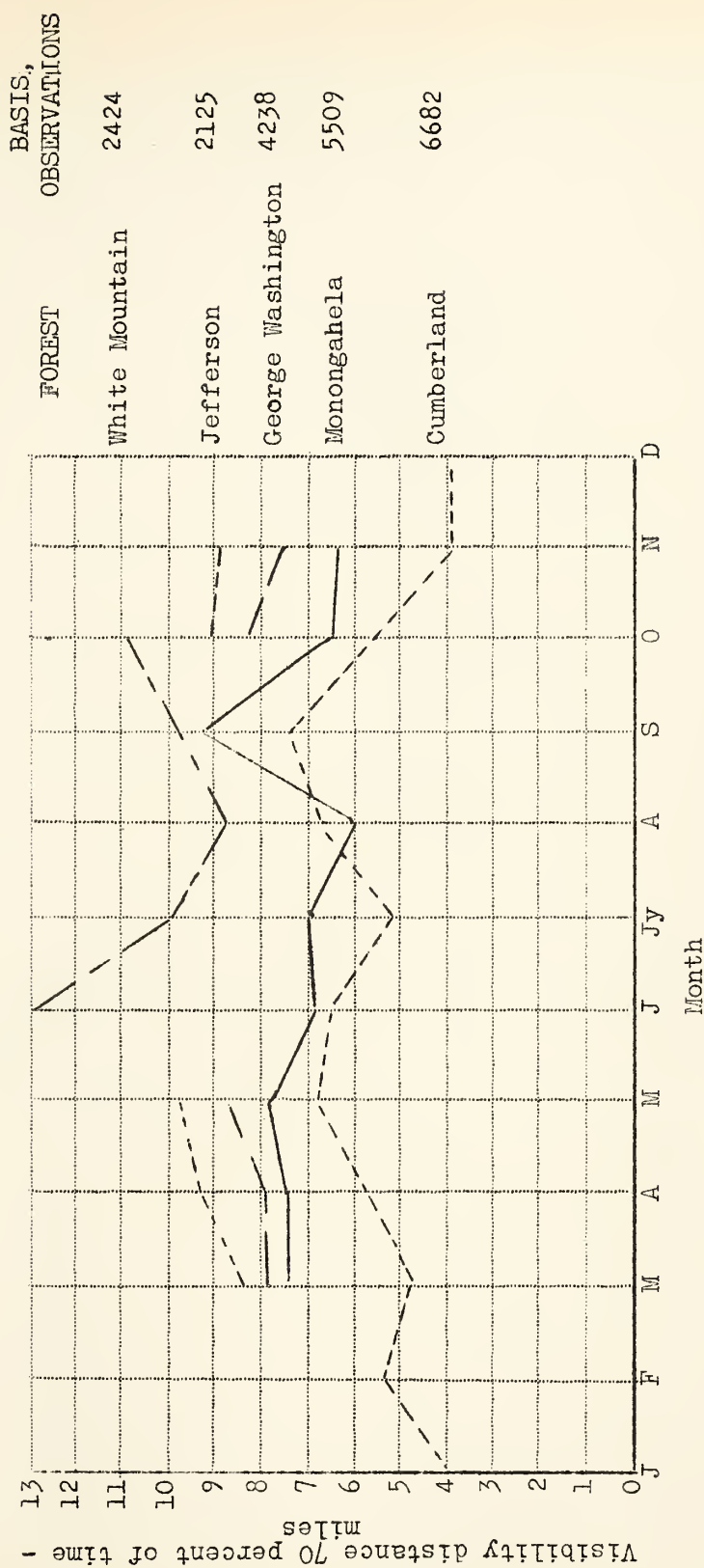


FIGURE 8

VISIBILITY DISTANCE 70 PERCENT OF THE TIME, BY MONTHS, FOR FIVE EASTERN NATIONAL FORESTS

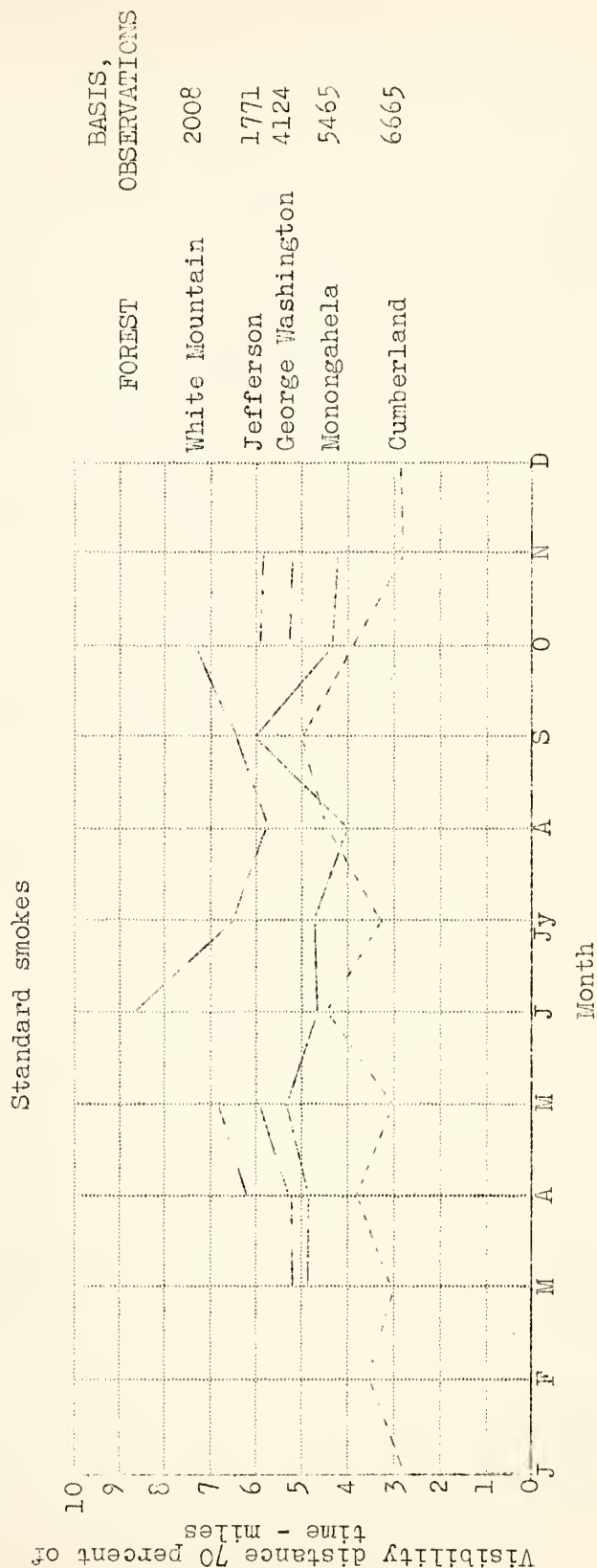


FIGURE 9

DIFFERENCES IN VISIBILITY DISTANCE OF EIGHTH-ACRE SMOKES BY HOURS OF THE DAY
THROUGHOUT THE YEAR

Cumberland National Forest, Kentucky

Basis: 6682 observations

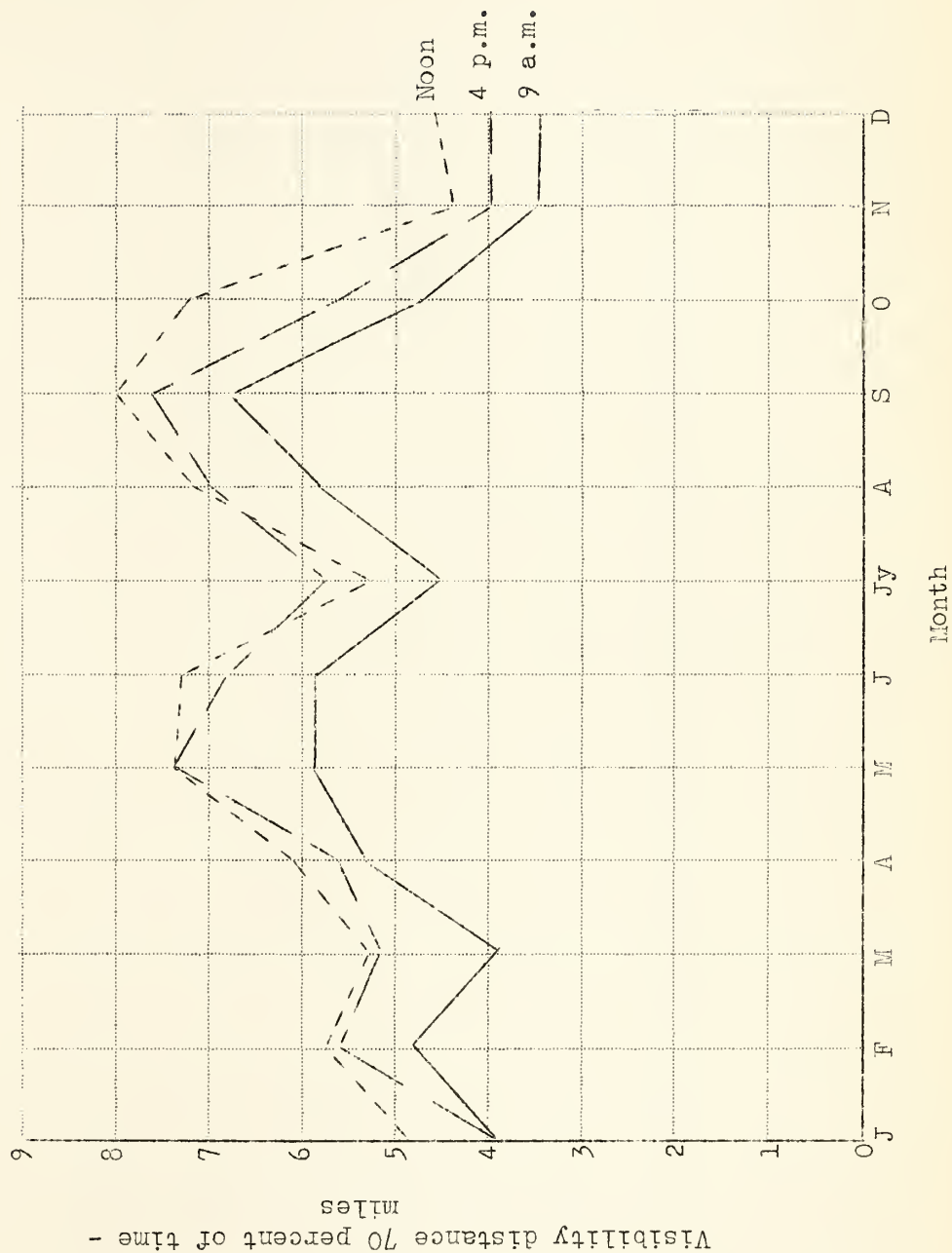


FIGURE 10

DIFFERENCES IN VISIBILITY DISTANCE OF STANDARD SMOKE BY HOURS
OF THE DAY THROUGHOUT THE YEAR

Cumberland National Forest - Kentucky

Basis: 6665 observations

